

CLAIMS

1. A pigment having a color-shifting effect comprising a base material which is alternatively coated with metal oxides of different refractive indexes, and an outer protection layer, wherein said base material is natural mica whose surface is coated with three-layered metal oxides; the first layer is a metal oxide having a high refractive index so as to smooth the step-like mica surface; the second layer is the metal oxide having low refractive index; and the third layer is a metal oxide having a high refractive index.
2. The pigment according to claim 1, wherein the thickness of the second metal oxide layer having low refractive index is more than the optical thickness of the 2nd-order interference color.
3. The pigment according to claims 1 or 2, wherein the thickness of the first metal oxide layer having a high refractive index is the optical thickness of silver-white to golden-yellow interference color.
4. The pigment according to claims 1 or 2, wherein the thickness of the second metal oxide layer having a low refractive index is the optical thickness of from the 2nd-order green to the 4th-order interference color.
5. The pigment according to claim 1, wherein the second metal oxide having a low refractive index is SiO₂.
6. The pigment according to claims 1 or 2, wherein the metal oxides having a high

refractive index are TiO_2 , SnO_2 , Fe_2O_3 , Fe_3O_4 , CoO , Co_2O_3 , ZrO_2 , or Cr_2O_3 or their mixture or compounds.

7. The pigment according to any of claims 1-6, wherein the synthesis of the pigment comprises: putting wet grinded mica powders with specific standards into deionized water and stirring it into a suspension solution; heating it to $60\text{-}90^\circ\text{C}$; then adjusting the pH value to 2-9 with diluted aqueous hydrochloric acid or sodium hydroxide solution; adding a pre-measured amount of dissolvable inorganic salt solution having a high refractive index; keeping its pH value constant by adding hydrochloric acid or sodium hydroxide solution, depositing hydrate metal oxide having high refractive index and the desired thickness on the surface of mica; stirring it for 30 minutes at constant temperature for ageing; adjusting its pH value to 6-4 with sodium hydroxide solution; adding a pre-measured amount of a dissolvable inorganic salt solution having a low refractive index; keeping its pH value constant by adding a hydrochloric acid solution to make the metal oxide having a low refractive index deposit to a desired thickness, stirring it for 30 minutes at constant temperature for ageing; adjusting its pH value to 2-9 with diluted aqueous hydrochloric acid or a sodium hydroxide solution; adding a pre-measured amount of inorganic salt solution having a high refractive index, keeping its pH value by adding a hydrochloric acid or sodium hydroxide solution to obtain the desired tones and zones of color changes; stir it for 30 minutes in constant temperature for ageing; and flitter, cleanse, dry, calcine, sift out and dry.
8. The pigment according to claim 7, wherein the dissolvable inorganic solution having a high refractive index is a chlorine-based compound, e.g., TiCl_4 , TiOCl_2 , SnCl_4 ,

SnCl_2 , FeCl_3 , FeCl_2 , CoCl_2 , ZrOCl_2 or CrCl_3 .

9. The pigment according to claim 7, wherein the dissolvable inorganic metal salt solution having a low refractive index is a hydrate glass compound.
10. The pigment according to claim 7-9, wherein an organic or an inorganic ferrous pigment or an outer protection layer can be added.